

The following observations have since been made :—

November 28, 17<sup>h</sup> 30<sup>m</sup>; R.A. 9<sup>h</sup> 23<sup>m</sup> 55<sup>s</sup>; Decl. N. 3° 12'.  
The comet is slightly brighter than it was yesterday morning.

December 12, 9<sup>h</sup> 30<sup>m</sup> (evening observation); R.A. 7<sup>h</sup> 9<sup>m</sup> 30<sup>s</sup>; Decl. N. 58° 19'. Considerably fainter. The comet is now circumpolar, and evening observations are possible.

December 13, 7<sup>h</sup>; R.A. 6<sup>h</sup> 55<sup>m</sup> 20<sup>s</sup>; Decl. N. 60° 23'. Large, but pretty faint.

December 16, 9<sup>h</sup>; R.A. 5<sup>h</sup> 58<sup>m</sup> 10<sup>s</sup>; Decl. N. 65° 30'. Faint.

The comet has at all times appeared large, round, and with very slight central condensation.

*Smith Observatory, Geneva, N.Y., (U.S.A.) :*  
1895 December 21.

*Elliptical Orbit Elements of Comet b 1894 (Gale).* By Rev.  
Thomas Roseby, M.A., LL.D.

The following elements are based on four normal places, derived, the first two from Mr. Tebbutt's Windsor observations only, the last two from observations made at Windsor (N.S.W.), Melbourne, Liverpool, Greenwich, Lyons, Besançon, and Dudley (U.S.A.). The time interval between the extreme normal places is 78 days. I have to express my indebtedness to Mr. J. Tebbutt, F.R.A.S., of Windsor, Mr. R. T. A. Innes, F.R.A.S., and Mr. C. J. Merfield, of Sydney, for help without which the labour of this computation would hardly have been undertaken. The residuals for the middle places seem fairly satisfactory. The orbit elements indicate a period for the comet of 1001·18 years. The elements are :

*Comet b 1894 (Gale).*

$\tau$  1894 April 13·393265 G.M.T.

$$\left. \begin{array}{ll} \pi & 170^\circ 35' 52'' 42 \\ \varpi & 206 \ 24 \ 11 \cdot 90 \\ i & 86 \ 58 \ 55 \cdot 73 \end{array} \right\} \text{Mean equinox 1894} \cdot 0.$$

$$\log q \quad 9 \cdot 9925685$$

$$\log e \quad 9 \cdot 9957130$$

Motion direct.

The residuals for the mean places are :

$$\begin{aligned} d\lambda, \cos \beta, &= -0 \cdot 59 \\ d\beta, &= -1 \cdot 64 \\ d\lambda_{\text{II}}, \cos \beta_{\text{II}}, &= +1 \cdot 48 \\ d\beta_{\text{II}}, &= +1 \cdot 27 \end{aligned}$$

It is to be remarked, however, in respect to this comet :

1. That the high inclination of the comet's orbit (nearly  $87^\circ$ ) necessarily introduces an element of uncertainty into its heliocentric coordinates on the plane of the ecliptic.

2. That the very slow movement of the comet during its earliest observations introduces a similar element of uncertainty into the *times* of these observations. Thus the movement of the comet from April 3 to April 8 was so slow that it amounted in R.A. to only about  $1''.0$  in 26 seconds of time, and in declination to only about  $1''.0$  in 75c seconds of time.

From these causes I shall not be surprised to find a considerable discrepancy between the above elements and those of the final definitive orbit, which orbit must itself, however, so it seems to me, be subject, more or less, to the same elements of uncertainty.

Parsonage, Marrickville, New South Wales :  
1896 January 1.

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*Occultation of Jupiter, 1893 February 20 as seen at the Durham University Observatory.*

(Communicated by the Director.)

The following are Mr. H. J. Carpenter's notes :—

*Jupiter* was found quite easily about 2 P.M., though it was faint. Unfortunately it clouded before the disappearance of the planet, and remained so till just before the reappearance, when the following observations were made :—

						G.M.T.		
						h	m	s
First seen, well off Moon's disc	...	...	...	...	...	3	7	26
Bisected	...	...	...	...	...	3	8	11.0
Last contact	...	...	...	...	...	3	9	40.7

It was observed with the 6-inch equatorial with a power of 100.

The impression I formed was that the last contact was late, probably  $2^s$  to  $4^s$ . Some seconds before this time the Moon's limb had the appearance of being bulged in, or a piece cut out. This occurred so rapidly, and I was watching for "last contact," that I could not give much attention to it.

The sky was very hazy and *Jupiter* faint, but the Moon's limb was fairly well defined.

After the last time given *Jupiter* appreciably separated from the Moon.

Longitude  $6^m 19^s.7$  W. of Greenwich.

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